

Proposal

Oneida County and Vilas County Wisconsin - Page 1 of 10

BAA number: G14PS00574

Title: U.S. Geological Survey 3DEP

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Proprietary Information: None

1) Executive Summary

Oneida and Vilas County Wisconsin are located in Northern Wisconsin and are well known for its physical and natural qualities. This area was once part of a vast forest region covering much of the Great Lakes area. Today, the area is a popular vacation and recreational area and has physical resources that are a key factor in the economic structure of the area evidenced by the number of paper and wood industry businesses in the Counties. Oneida and Vilas County are Wisconsin's richest counties in terms of water resources. Along with excellent watershed characteristics, as a result of a high percentage of land in forest cover, the counties have one of the highest concentrations of natural lakes in the world. The Wisconsin, Tomahawk, Eagle, Wolf, Manitowish, Bear, Turtle & Squaw Rivers are the main rivers in addition to over 1200 miles of streams. These waterways drain eventually to the Mississippi River, Lake Superior, or Lake Michigan.

Oneida and Vilas County covers approximately 2,295 sq miles. The Chequamegon – Nicolet National Forest (100 sq miles), American Legion and Northern Highlands State Forest (412 sq miles), County Forest (190 sq miles) and several scenic water areas are located in these counties. In addition, the Lac du Flambeau Band of Lake Superior Chippewa Indians is located in the western part of Vilas County. The use of quality topographic data is critical to help the public and decision makers to develop plans in protecting the diverse natural resources, implementing best management practices for the forest industry and for development of properties for residential, recreational or wildlife purposes.

2) Technical Proposal

AYRES ASSOCIATES from Madison Wisconsin and AERO-METRIC (NKA Quantum Spatial) from Sheboygan Wisconsin teamed up to provide the LiDAR mapping services and flew both Oneida and Vilas counties in May of 2013 under leaf off and no snow or ice conditions.

See “List of required dataset deliverables and minimum acceptance criteria” below for the technical specifications and guidelines that were adhered to for the deliverables.

Oneida County employed the services of ATKINS, Roseville California to assist with an independent review of the deliverables to ensure the specifications were met.

Data was delivered for Oneida in the Oneida County–Wisconsin Coordinate Reference System and for Vilas in the Vilas County–Wisconsin Coordinate Reference System. The coordinates are mathematically based and related to the National Geodetic Reference system NAD 1983(91). The vertical values are reference to North American Vertical Datum of 1988. Units are U.S. feet.

Vilas County is completed and Oneida County will be completed 1-1-2015.

3) List of required dataset deliverables and minimum acceptance criteria.

All deliverables were produced meeting or exceeding these guidelines or specifications:

1. USGS LiDAR Guidelines and Base Specifications v. 1; see note below pertaining to QL2 data.
2. The Guidelines and Specifications for Flood Hazard Mapping Partners Appendix A: Guidance for Aerial Mapping and Surveying; Federal Emergency Management Agency. April 2003 (including the Procedure Memorandum No. 61-Standards for LiDAR and Other High Quality Digital Topography, September 2010.
3. The USGS LBS v1 was followed as a guideline for how the LiDAR was acquired.
4. In addition, the Contractor flew the entire area at 50% overlap to ensure coverage in the forested areas.
5. Section VI on Page 9 of the BAA lists additional requirements to the USGS Specifications to meet QL2 data.

The Oneida County dataset has been tested and the overall RMSE is 0.290 feet and on bare earth surfaces is 0.18 feet. The Vilas County dataset has an overall RMSE of 0.295 feet on all land cover types required for FEMA reporting. This represents an extremely accurate data set which meets QL2 specifications.

The following datasets were also delivered meeting or exceeding the minimum criteria for FEMA and USGS standards for these features: 1) countywide 2-foot contour surface; 2) bare earth DTM; 3) first return digital surface model (DSM); 4) digital elevation model (DEM); 5) intensity images; 6) hydro enforced break lines which are hydro-flattened; 7) low confidence area polygons; 8) and additional classifications for low, medium and high vegetation, buildings, bridges, and dams.

4) Proposed offeror cost-sharing contribution to project and costing assumptions (if any).

Oneida and Vilas County contracted for LiDAR acquisition and processing in 2013. The actual cost that the counties are paying for the LiDAR is listed below.

Oneida County LiDAR project cost = \$252,402

Oneida County 3rd party consultant to review data = \$35,000

Vilas County LiDAR project cost = \$208,598

Total project cost: \$496,000. Grant request \$70,000. Net cost contribution from Counties: \$426,000.

5) Diagram (map) and shapefile of proposed project area.

Please see Page 10 of this proposal. Shapefile in attached is Mandatory File Section.

6) Offerors (prime and subcontractors) are to provide past performance information for relevant and current references.

AERO-METRIC (NKA Quantum Spatial) from Sheboygan WI teamed up with AYRES ASSOCIATES from Madison WI to provide the LiDAR acquisition and mapping services. Under contract number W192P908D0503, there is a Quantum Spatial Contractor Performance Assessment Rating Report (CPAR) for a \$788,720 project completed January 20, 2009 for LiDAR acquisition and processing. That project covered Champaign, Grundy, Kane, and McHenry Counties in Illinois. Other relevant reports are available under this contract.

The Ayres Associates/Quantum Spatial team has significant experience providing LiDAR services to counties and municipalities throughout Wisconsin. Twenty counties completed countywide LiDAR projects through the Wisconsin Regional Orthophotography Program (WROC) in 2010-11, totaling more than 12,000 square miles. Eighteen of these counties received federal grants that covered 100% of their project costs through the Federal Emergency Management Agency (FEMA) Community Development Block Grant – Emergency Assistance Program. Nearly all of these counties have now submitted their data to FEMA for inclusion in the Floodplain Modernization Program and to the USGS for inclusion into the National Map. Our experience working with USGS, FEMA, and the Wisconsin DNR has helped us understand each organization’s specific requirement for LiDAR data. This puts us in a strong position to serve each WROC participant’s interests in ensuring its LiDAR data meets FEMA and USGS standards for content, accuracy, and completeness. Since WROC 2010, the Ayres Associates/Quantum Spatial team has continued to be the leading LiDAR provider in the state of Wisconsin. The Team has completed 15 more county wide LiDAR projects under the WROC program, and is planning to complete at least six more county wide projects in 2015 under WROC. To date, the Team has completed more than 75% of the county wide lidar projects in Wisconsin.

ATKINS is part of the STARR alliance performing Riskmap Assessments for various communities within Region V (Ohio, Michigan, Wisconsin, Indiana and Illinois) which uses various types of topographic data. Atkins also provides project management and quality review services on the Central Valley Flood Evaluation and Delineation (CVFED) project encompassing 9000 square miles in the central valley of California for the California department of Water Resources (DWR). The \$30 million topographic portion of this project entails writing of detailed specifications and quality reviews for ground control; aerial imagery and LiDAR acquisition; digital orthophotographs; LiDAR processing to include derivative products such as DEM’s, DTM’s, ASCII files, low confidence area polygons, and hydro enforced breaklines; ground field surveys and bathymetric cross sections. Atkins has also reviewed over 1000 square miles of LiDAR data for Austin, Texas and the surrounding areas to validate that it met FEMA specifications. CPAR reports are available for the following contracts and there are others if needed:

HSFEHQ09D0370HSFE0512J0011; HSFEHQ09D0370HSFE0509J0001;

HSFEHQ09D0370HSFE0510J003; HSFEHQ09D0370HSFE0511J0090.

7) Qualification statement describing the experience and capability for acquiring and performing quality assurance of LiDAR data and derived products.

Oneida County contracted with ATKINS, Roseville, CA to assist the county with an independent review of the data to ensure that the Contractor met the specifications and contractual obligations for the project. A combination of automated and manual routines were used to validate that the data met FEMA and USGS specifications. A rigorous review was performed on the data that included: readability, proper geo-referencing, project coverage, scan angle, sidelap, data voids, low confidence polygons, point density, horizontal datum, vertical datum, units, projection, LAS version 1.2, geo referencing information in VLR of LAS header, existence of proper data in each point cloud record, duplicates (none allowed), calibration flight lines, correct number of classes, bare earth classification, proper classification, data consistency – relative accuracy, contours, hydro enforced lakes, streams, rivers; DEM's, DSMs, Intensity images and meta data. Oneida County performed the ground survey to check over 100 points scattered throughout the county using similar methods as outlined below for Vilas, and all points passed the minimum requirements and an accuracy report generated.

Vilas County performed in-house checks on the data and Ayres and Associates provided all of the above checks for Vilas County and performed the ground survey control report and FEMA accuracy report. In addition, Vilas County field verified over 95 independent points and found all points to be within specifications. Methodologies for Vilas County (VC) Lidar Data Quality Checks. Using 2010 aerial photographs, VC staff chose areas in each town that best reflected the various categories for LIDAR data. VC staff used a survey-grade Trimble GeoXR network GPS rover to occupy those locations selection for quality checks. Site photos were taken and each location was marked with a 10" spike if necessary to return to re-observe. VC staff also observed Primary, Secondary and Tertiary Control Stations, along with various NGS and USGS benchmarks and control stations, to assure that the

GPS data was compatible with published horizontal and vertical datums. Using the GeoXR and Trimble Business Center processing software, the raw gps data was converted to shape files for importing into the ESRI software. Upon receipt of the LIDAR data, VC staff compared the field data with the delivered LIDAR data for quality assurance.

8) Describe the qualifications of the principal staff and other key personal involved in the project.

Primary technical responsibility and contact.

Michael J Romportl, Oneida County Land Information Director since 1993. Wisconsin Professional Land Surveyor since 1981; Associate Degree in Land Surveying and Industrial Electronics (1977 & 1979); Adjunct Instructor in Land Surveying Nicolet Area Technical College. Over 30 years experience in GIS, Surveying and project management.

Key personnel

Art Hilgendorf, Oneida County GIS Administrator; Associate Degree in Land Surveying; over 15 years of GIS/Surveying experience.

Randy Boehlert, Oneida County GIS Specialist since 2001; 18 years of work experience in GIS/Surveying; UW-Whitewater BS Physical and Environmental Geography, Minor GIS.

Thomas Asbeck, ATKINS, Roseville, CA Project Director, Integrated Water Resources – Southwest. Thomas is a Professional Engineer, Certified Photogrammetrist, and Professional Land Surveyor with over 40 years experience specializing in surveying, mapping and photogrammetry. He has a bachelors and masters degree in civil engineering from the UW – Madison. For the past 5 years he led numerous quality review efforts of LiDAR data in Wisconsin, Maine, Texas, Nevada and California and was a co-presenter for a quality workshop at ASPRS.

Barbara A. Gibson, Vilas County GIS Administrator/Land Information Officer since 2004. BS Geography/Cartography and GIS minor, UW-Stevens Point, 2002; BS in Natural Resources Management/Parks & Recreation, UW-Stevens Point, 1981. Adjunct Instructor in GIS Spatial Analysis and Special Capstone Projects, Nicolet Area Technical College, 2013-2014.

Adam Grassl, Vilas County GIS Analyst since 2007; BS Geography in 2001; over 10 years experience in GIS.

Anthony Jones, Vilas County GIS Technician since 2012. Wisconsin Professional Land Surveyor since 2000. BS Geology, UW-Eau Claire 1992, Associate Degree in Land Surveying, Nicolet Area Technical College, 1996, 18 years experience in land surveying and GPS data acquisition.

9) Statement agreeing to acquire data that meet or exceed all minimum specifications and product deliverables as outlined in USGS lidar acquisition specifications version 1.0 requirements and incorporating the changes in specification version 1.1.

See section titled: "List of required dataset deliverables and minimum acceptance criteria".

10) Statement agreeing to provide all project deliverables to the USGS without use restrictions upon acceptance of the project deliverables.

All deliverables would be provided to USGS **without** use restrictions.

11) Amount of funds and percent of total project cost requested from USGS.

Oneida and Vilas County request a 'grant' to obtain the data for the public domain in the amount of \$35,000 for each County for a total grant amount of \$70,000, which is 14.11% of the total project cost. This is less than \$31 per square mile for USGS to acquire quality LiDAR data that would be immediately available for inclusion in the 3DEP program. The total project cost for both counties is \$496,000 which represents the contracted services cost. Provided the grant request is approved, it would result in a net cost to the counties of \$426,000 which represent 85.89% being paid for by the counties. No funding for county staff time, facilities, equipment etc or indirect costs are being requested to be covered under this request.

12) Benefits

Vilas County has already received all of their deliverables and Oneida County expects to have the final deliverables in December 2014. While the costs of these projects have been paid, the Counties feel there is an immediate benefit to the public to partner with USGS and make this data available in the public domain at a very reasonable cost to the agency. These two counties did not have any previous LiDAR

data sets available and has never been mapped to a level that would support the 3D Elevation Program (3DEP) prior to this current effort. The counties are located in an area that would fill in the gap between priority areas and given the amount of water bodies in this area would be of great benefit to the 3DEP Program. The 'grant' would be applied to perform any further processing needed to submit the data to USGS and partly cover the cost of the already acquired and tested data.

The executive summary of this proposal lists over 700 square miles of public lands out of the 2,295 sq miles that this project covers, which will be a significant benefit to the public agencies that manage these public lands. In addition, County, Town and City departments that will benefit from accurate elevation include Highway, Emergency Management, Forestry, Land Information, Planning and Zoning, and Land and Water Conservation, Economic Development.

More specific benefits are listed as follows:

Improved subdivision planning for preliminary designs and other site plans that require elevation data; accurate slope and drainage pattern determination; improved water quality by locating point and non-point source pollution; better elevation data to work with local farmers on runoff issues; infrastructure management for road, bridge, dam and culvert construction; improved storm water management.; flood plain mapping requires up-to-date contour maps for potential flood insurance savings; elevation data for conservation plans and shoreline zoning setbacks; emergency response for Wireless 911, accurate sector data definition and search and rescue locations; accurate elevations to check surveyor data; Hydrologic modeling for watersheds and sub-watersheds; Geologic/Geomorphology for bedrock and sediment mapping; Better elevation results in more accurate orthophotographs.

Federal agencies which would benefit from this project include USGS, USDA-NRCS, and FEMA.

LiDAR data would also benefit state agencies like the Wisconsin Department of Natural Resources, Wisconsin Department of Transportation, and Wisconsin Department of Military Affairs (Emergency Management Division), and the Wisconsin State Cartographer's Office.

Other outside agencies or companies working with the counties would also benefit. LiDAR data is also very beneficial to private businesses ie, surveyors, engineers, planners, designer and architects.

13) Authorization to Submit Proposal

At the Oneida County Board of Supervisors Land Records Committee meeting of August 12th, 2014, the Committee unanimously approved a motion authorizing Oneida County Land Information to submit a pre-proposal funding request for the U.S. Geological Survey 3DElevation Program BAA G14PS00574 and on December 9th, 2014 the Committee approved a motion to submit a Final Proposal.

At the Vilas County Board of Supervisors Land Records Committee meeting of August 7th, 2014, the Committee unanimously approved a motion to forward a resolution to the Vilas County Board authorizing Vilas County Land Information to submit a funding request for the U.S. Geological Survey 3DElevation Program BAA G14PS00574 which was approved on August 26th, 2014.

Len Fralick, who is a representative of the Lac du Flambeau Band of Lake Superior Chippewa Indians GIS Mapping and Planning Department, contacted Vilas County for obtaining LiDAR data from the 2013 Oneida-Vilas County project. Vilas County has provided GIS data to the Tribe in the past and intends to continue providing GIS data and technical assistance including the LiDAR or derivative products to the Tribe as requested.

14) Schedule

LiDAR dataset could be delivered within 120 days of notice of grant award.

Thank you for consideration of this request.

See Page 10 for map as noted in Item #5.

2013 LiDAR Project Area

Oneida and Vilas Counties, Wisconsin

- County Lands
- State Lands
- Federal Lands
- Tribal Lands
- US Highway
- State Highway
- County Highway

